PRELIMINARY

Solid State Devices, Inc.
14701 Firestone Blvd * La Mirada, Ca 90638
Phone: (562) 404-4474 * Fax: (562) 404-1773
ssdi@ssdi-power.com * www.ssdi-power.com

SGF30E100Z8

30 AMP, 1000 VOLTS, 160 mΩ typ
Dual GaN FET Normally-Off

Designer's Data Sheet

Part Number/Ordering Information[1/]

SGF30E100 __ __ __

└ **Screening[2/]**
__ = Not Screened
TX = TX Level
TXV = TXV Level
S = S Level

└ **Lead Bend Options**
__ = Straight Leads
UB = Up Bend
DB = Down Bend

└ **Package**
Z8 = 8 Pin TO-254Z

FEATURES:
- Two Devices in One Compact Hermetically Sealed Package
- Connect in Parallel to Achieve 30 A
- Can Be Used Individually or in Half Bridge Configuration (15 A)
- 3rd Generation Gallium Nitride Technology
- Combines GaN HEMT and Low Voltage Si MOSFET (Cascode) for Superior Performance
- Works with Common Gate Drivers
- Low $R_{DS(ON)}$
- Low Q_G Simplifies Gate Drive Circuit
- Very Fast Switching for High Frequency Applications
- Low Thermal Resistance
- TX, TXV, and S-Level Screening Available[2/]
- Available as Normally On (without Si FET Driver)

APPLICATIONS:
- High Efficiency DC-DC / PoL Converters
- Motor Controller
- Robotics / Automation
- Military and Aerospace

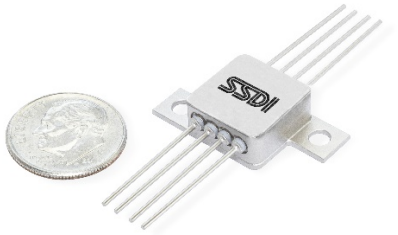
BENEFITS:
- GaN Transistor offers superior advantages over Si based MOSFET: zero Q_{RR}, low gate charge, low $R_{DS(ON)}$, fast switching speed and low temperature coefficient.
- Benefits circuit designer through higher efficiency, lower cross-over losses and On-state losses.
- Eliminates the need to add free-wheeling diode

Maximum Ratings (per device)[3/]		Symbol	Value	Units
Continuous Drain – Source Voltage		V_{DSS}	1000	V
Gate – Source Voltage		V_{GS}	±18	V
Continuous Drain Current	T_C = 25°C T_C = 100°C	I_{D1} I_{D2}	15 10	A
Pulsed Drain Current Pulse width: 10 µs		I_{D3}	58	A
Total Power Dissipation		P_D	62	W
Operating & Storage Temperature		T_{OP} & T_{STG}	-55 to +150	°C
Thermal Resistance Junction to Case		$R_{\theta JC}$	2	°C/W

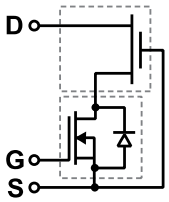
NOTES:
1/ For ordering information, price, operating curves, and availability- contact factory.
2/ Screening based on MIL-PRF-19500. Screening flows available on request.
3/ Unless otherwise specified, all electrical characteristics @ 25°C.
4/ Pulse Test, P_W = 300 µs, D.C. = 2%.

AVAILABLE PART NUMBERS:
SGF30E100Z8, SGF30E100Z8UB, SGF30E100Z8DB
**Dime used for size reference*

8 Pin TO-254Z (Z8)



Cascode Device Structure



NOTE: All specifications are subject to change without notification. SCD's for these devices should be reviewed by SSDI prior to release.	DATA SHEET #: FT0087A	DOCX

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Electrical Characteristics (per device)[3/]		Symbol	Min	Typ	Max	Unit
Drain to Source Breakdown Voltage	I_D = 100 µA, V_{GS} = 0 V	BV_{DSS}	1000	-	-	**V**
Gate to Source Forward Leakage	V_{GS} = +18 V	I_{GSSF}	-	50	100	**nA**
Gate to Source Reverse Leakage	V_{GS} = -18 V	I_{GSSR}	-	10	-100	
Drain to Source Leakage Current	V_{DS} = 1000 V, V_{GS} = 0 V	I_{DSS}	-	1	30	**µA**
	V_{DS} = 1000 V, V_{GS} = 0 V, T_J = 150°C		-	12	-	
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 0.5 mA	$V_{GS(TH)}$	1.6	2.0	2.6	**V**
Drain to Source On State Resistance[4/]	V_{GS} = 10 V, I_D = 10 A	$R_{DS(ON)}$	-	160	190	**mΩ**
	V_{GS} = 10 V, I_D = 10 A, T_J = 150°C		-	350	-	
Total Gate Charge	V_{GS} = 8 V, V_{DS} = 600 V, I_D = 10 A	Q_G	-	10	-	**nC**
Gate to Source Charge		Q_{GS}	-	2.6	-	
Gate to Drain Charge		Q_{GD}	-	2.9	-	
Output Charge	V_{GS} = 0 V, V_{DS} = 0 V to 600 V	Q_{OSS}	-	53	-	**nC**
Input Capacitance	V_{GS} = 0 V, V_{DS} = 600 V, f = 1 MHz	C_{ISS}	-	780	-	**pF**
Output Capacitance		C_{OSS}	-	41	-	
Reverse Transfer Capacitance		C_{RSS}	-	5	-	
Output Capacitance, Energy Related	V_{GS} = 0 V, V_{DS} = 0 V to 600 V	$C_{O(ER)}$	-	54	-	**pF**
Output Capacitance, Time Related	V_{GS} = 0 V, V_{DS} = 0 V to 600 V	$C_{O(TR)}$	-	88	-	**pF**
Turn-On Delay	V_{DS} = 600 V, V_{GS} = 8 V, I_D = 10 A, R_G = 22 Ω	$t_{D(ON)}$	-	26	-	**ns**
Rise Time		t_R	-	5	-	
Turn-Off Delay		$t_{D(OFF)}$	-	40	-	
Fall Time		t_F	-	7.4	-	
Reverse Current[4/]	V_{GS} = 0 V, T_C = 100°C, ≤ 25% duty cycle	I_S	-	-	9.5	**A**
Reverse Voltage[4/]	I_S = 10 A, V_{GS} = 0 V	V_{SD}	-	2.3	-	**V**
	I_S = 5 A, V_{GS} = 0 V		-	1.6	1.9	
Reverse Recovery Time	I_S = 10 A, V_{DD} = 600 V, di/dt = 1000 A/µs	t_{RR}	-	32	-	**ns**
Reverse Recovery Charge	I_S = 10 A, V_{DD} = 600 V, di/dt = 1000 A/µs	Q_{RR}	-	49	-	**nC**

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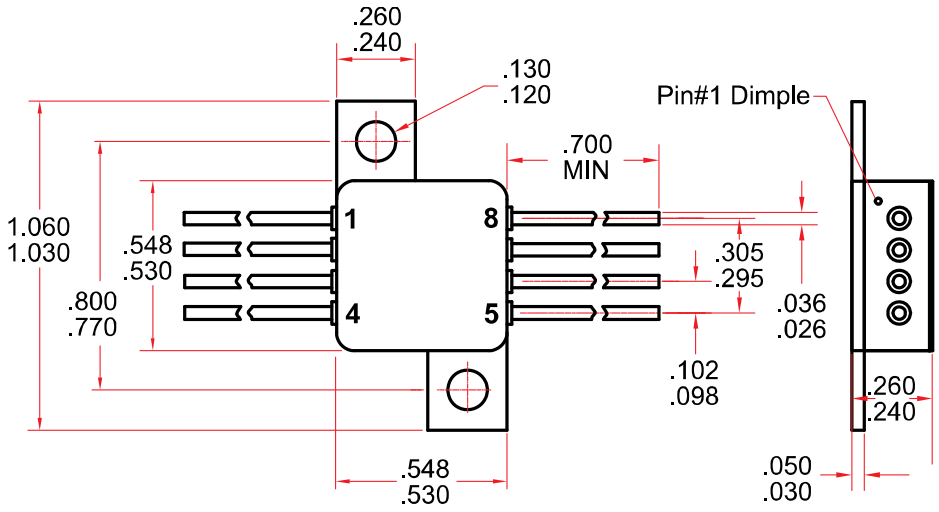
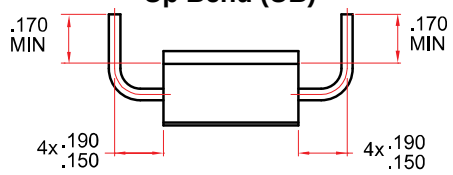
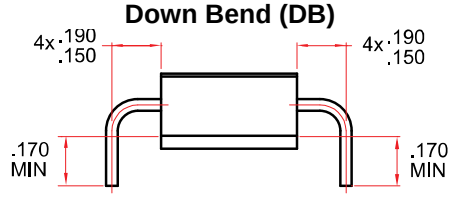
Package Outline: 8 Pin TO-254Z (Z8)

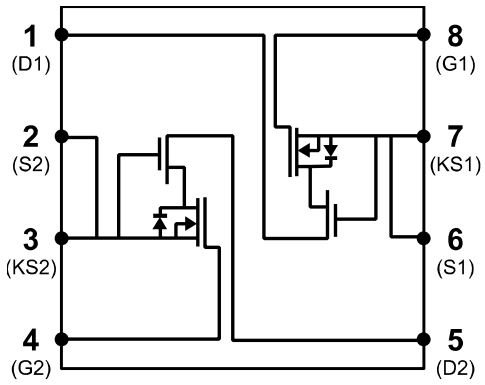


Up Bend (UB)



Down Bend (DB)





PIN ASSIGNMENT	
8 Pin TO-254Z (Z8)	
Drain 1 (D1)	1
Source 1 (S1)	6
Kelvin Source 1* (KS1)	7
Gate 1 (G1)	8
Drain 2 (D2)	5
Source 2 (S2)	2
Kelvin Source 2* (KS2)	3
Gate 2 (G2)	4

**Return line for the gate driver*

Dimensions in inches